MASTER

XVI

Agricultural Memorandum No.XVI

Mean temperatures during night hours

It is often required to know the mean temperature during the hours of daylight and especially during the hours of darkness. Such data are not immediately available from the conventional records of mean maxima and mean minima.

Hourly means of temperature are available in M.O.3 (Climat) for Kew and Aberdeen for the period 1901-1930. Knowing times of sunrise and sunset, the required mean night (or day) temperatures can be found for these stations.

If we now assume that these means can be related to the mean maxima and mean minima by a formula which will depend on day length (and hence vary from month to month) we can suggest the following factors:-

	Proportion of mean diurnal range to be subtracted from mean maximum to obtain mean day temperature		Proportion of mean diurnal range to be added to mean minimum to obtain mean night temperature	
	Kew	Aberdeen	Kew	Aberdeen
January	0.33	0.35	0.45	0.49
February	0.34	0.35	0.38	0.42
March	0.35	0.34	0.32	0.35
April	0.35	0.36	0.28	0.28
May	0.37	0.39	0.27	0.25
June	0.41	0.43	0.25	0.24
July	0.39	0.40	0.23	0.23
August	0.39	0.39	0.27	0.29
September	0.35	0.35	0.30	0.33
October	0.33	0.29	0.35	0.39
November	0.32	0.30	0.43	0.45
December	0.30	0.36	0.44	0.49

Incidentally the mean night temperature is very close to the mean midnight temperature at both stations.

Approximate values for other stations can now be found for southern England and northern Scotland by using these factors and interpolated values for southern Scotland and northern England. The mean night temperatures (to the nearest half degree) for stations where averages are given in M.O.571 are given herewith.

Harrow.
August, 1957.

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Mean Night Temperatures (1921-50) I

		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
E. Scotland	Lerwick	38.0	37.5	37.5	39.5	43.0	47.0	51.0	51.5	49.0	45.0	41.5	40.0
	Wick	39.0	38.5	39.5	41.0	44.5	48.5	52.0	52.5	50.5	46.5	42.5	40.5
	Fortrose	38.5	38.5	40.0	42.5	46.5	51.0	55.0	55.0	51.5	47.0	42.0	39.5
	Inverness	38.0	38.0	39.5	41.5	45.5	50.5	54.0	54.5	51.0	46.0	41.5	39.5
	Banff	38.0	38.5	40.0	42.0	46.0	51.0	54.5	54.5	52.0	47.0	42.0	39.5
	Aberdeen	38.5	38.5	39.5	41.5	45.5	50.5	54.5	54.5	51.5	47.0	42.5	40.0
	Balmoral	34.0	34.0	35.5	38.0	42.0	47.5	51.0	51.0	47.5	43.0	37.5	35.5
	Dundee	37.5	37.5	39.5	41.5	45.5	51.0	54.5	55.0	51.5	47.0	41.0	39.0
	Perth	37.0	37.5	39.5	42.0	46.0	51.5	55.0	55.0	51.5	46.5	40.5	38.5
	Leuchars	38.0	38.5	40.0	42.0	45.5	50.5	54.5	54.5	51.5	47.0	42.0	39.5
	Edinburgh	38.5	38.0	39.5	42.0	46.0	51.5	55.0	55.0	52.0	47.0	42.0	40.0
	Kelso	36.5	37.0	39.0	41.5	46.0	51.0	54.5	54.0	51.0	46.0	40.5	38.0
W. Scotland	Stornoway	40.5	40.0	40.5	42.0	45.5	49.5	53.0	53.5	51.0	47.0	43.5	41.5
	Rothesay	40.0	39.0	40.5	42.5	46.5	51.0	54.0	54.5	52.0	47.5	43.5	41.0
	Stirling	38.0	38.5	40.5	43.0	47.0	52.5	55.5	55.5	52.0	47.0	41.5	39.5
	Greenock	39.5	39.0	40.5	43.0	47.5	52.5	56.0	56.0	53.0	48.0	43.0	41.0
	Renfrew	38.0	38.5	40.0	42.0	46.5	51.5	55.0	55.0	51.5	47.0	41.5	39.0
	Turnberry	40.0	39.5	41.0	43.5	47.0	52.0	55.5	55.5	53.0	49.0	44.0	41.5
	Dumfries	38.0	38.0	39.5	42.0	46.5	52.0	55.0	55.0	51.5	47.0	41.5	39.0
N.W. England	Douglas I.O.M.	41.0	40.0	41.0	43.5	47.5	52.5	55.0	56.0	53.5	49.5	45.0	42.5
	Keswick	39.5	38.5	40.5	42.5	47.5	52.5	56.0	56.0	52.5	48.0	43.0	40.5
	Appleby	36.0	36.0	38.5	41.0	46.0	50.5	54.0	54.0	51.0	45.5	40.0	37.5
	Blackpool	39.5	39.0	41.0	44.0	48.0	53.5	57.5	57.5	54.0	49.5	44.0	40.5
	Burnley	37.5	37.0	39.0	42.0	46.5	52.0	55.5	55.5	52.0	47.0	41.5	38.5
	Manchester	39.5	39.5	41.5	44.5	49.0	54.5	58.0	57.5	54.5	49.0	43.5	40.5
	Southport	39.5	39.0	41.0	44.0	48.0	53.5	57.0	57.0	54.0	49.0	43.5	40.5
	Liverpool	39.5	39.0	41.0	44.5	49.0	54.0	57.5	57.5	54.5	49.0	44.0	41.0
N.E. England	Berwick-on-Tweed	38.5	38.5	40.0	42.0	45.5	51.0	54.5	54.5	52.0	47.5	42.5	40.0
	Tynemouth	39.5	39.5	41.0	43.5	47.0	52.5	56.5	56.5	54.0	49.5	44.0	41.0
	Durham	37.5	37.0	39.0	41.5	45.5	51.0	55.0	55.0	52.0	47.0	41.5	38.5
	Scarborough	39.5	40.0	41.5	44.0	48.0	53.5	57.5	57.5	55.0	50.0	44.0	41.0
	York	38.5	38.5	40.5	44.0	48.5	54.0	57.5	57.5	54.0	48.5	43.0	39.5
	Hull	39.0	39.0	41.0	44.0	48.5	54.0	58.0	58.0	55.0	49.5	43.5	40.0
	Bradford	37.5	37.0	39.5	42.5	47.0	52.5	56.5	56.0	53.0	47.5	42.0	39.0

Mean Night Temperatures (1921-50) II

		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
N.E. England (contd.)	Ilkley	37.0	37.0	39.0	42.0	46.5	52.0	56.0	55.5	52.5	47.0	41.5	38.5
	Wakefield	38.5	38.0	40.5	43.5	48.0	53.5	57.0	57.0	54.0	48.5	42.5	39.5
	Sheffield	39.0	38.5	40.5	43.5	48.0	54.0	58.0	57.5	54.5	49.0	43.0	40.0
E. England	Cranwell	37.5	37.5	39.5	43.0	47.5	53.0	56.5	56.5	53.5	48.0	42.5	38.5
	Cleethorpes	38.5	38.5	40.5	44.0	48.0	53.5	57.5	57.5	54.5	49.0	43.5	39.5
	Skegness	38.0	38.0	40.0	43.5	48.0	53.5	57.5	57.5	55.0	49.0	43.0	40.0
	Cromer	39.0	38.5	41.0	44.0	48.5	54.0	58.0	58.5	56.0	50.0	44.0	40.5
	Yarmouth	39.5	39.0	40.5	44.5	49.0	54.5	58.5	59.0	56.5	51.0	45.0	40.5
	Norwich	38.0	38.5	40.5	44.0	49.0	54.5	58.0	58.0	55.0	49.0	43.0	39.0
	Felixstowe	39.0	38.5	40.5	44.5	49.5	55.5	59.0	60.0	57.0	51.0	45.0	40.5
	Cambridge	38.5	38.0	40.0	43.5	48.5	54.0	57.0	57.5	54.0	48.0	42.5	39.0
	Luton	37.5	37.5	39.5	43.0	48.0	53.0	57.0	57.0	53.5	47.5	42.0	38.5
	St. Albans	37.5	37.5	39.5	43.0	48.0	53.0	56.5	56.5	53.5	47.5	42.0	38.5
	Halstead	38.0	38.0	40.5	44.0	49.0	54.0	58.0	58.0	54.5	48.5	42.5	38.5
	Shoeburyness	39.0	39.0	40.5	44.5	49.5	55.0	59.0	59.0	56.0	50.5	44.0	40.0
E. Midlands	Buxton	35.5	35.0	37.0	40.5	45.0	50.5	54.0	54.0	50.5	45.5	40.5	37.0
	Mansfield	37.5	37.0	39.5	43.5	48.0	53.5	57.0	56.5	53.5	47.5	42.0	38.0
	Nottingham	38.5	38.0	40.5	44.5	49.0	54.5	58.0	57.5	54.5	48.5	43.0	39.5
	Coventry	38.0	37.5	40.0	43.5	48.5	54.0	57.0	57.0	53.5	47.5	42.0	38.5
	Rugby	37.5	37.0	39.0	42.5	47.5	53.0	56.5	56.0	53.0	47.0	42.0	38.0
	Oxford	39.0	38.5	41.0	44.5	49.5	54.5	58.0	58.0	54.5	48.5	43.0	39.5
W. Midlands	Birmingham	38.5	38.5	40.5	44.0	48.5	54.0	57.0	57.0	54.0	48.5	43.0	39.5
	Shrewsbury	38.0	38.5	40.0	44.0	48.0	54.0	57.0	57.0	53.5	47.5	43.0	39.5
	Malvern	39.0	38.5	41.5	45.0	49.5	55.0	58.0	58.5	54.5	49.0	43.5	40.0
	Worcester	38.5	38.0	40.0	43.5	48.5	53.5	57.0	56.5	53.0	47.5	42.5	39.5
	Hereford	38.5	38.0	40.0	43.5	48.0	53.0	56.5	56.5	53.0	47.5	42.5	39.5
	Ross-on-Wye	40.0	39.5	41.0	44.0	49.0	54.0	57.5	57.5	54.0	48.5	43.5	40.5
	Cheltenham	39.5	38.5	41.0	44.0	49.5	55.0	58.0	58.0	54.5	48.5	43.0	40.0
	Macclesfield	37.0	37.0	39.5	42.5	47.5	53.0	56.0	56.0	52.5	47.0	41.5	38.0
Wales	Rhyl	41.0	40.0	41.5	44.5	49.0	54.0	57.0	57.5	54.5	50.0	45.0	42.0
	Llandudno	42.5	41.0	42.5	45.5	49.5	54.5	57.5	58.0	55.5	51.0	46.0	43.0
	Holyhead	42.5	41.5	42.5	45.0	49.0	53.5	56.5	57.5	55.5	51.5	47.0	44.0
	Haverfordwest	41.5	40.5	41.5	44.0	48.5	53.0	56.0	56.5	54.0	49.5	45.0	42.5
	Tenby	42.0	41.0	42.5	45.5	49.5	54.5	57.5	58.0	55.5	51.0	46.0	43.0

Mean Night Temperatures (1921-50) III

		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Wales (contd.)	Swansea	41.5	41.0	43.0	46.0	51.0	56.0	59.0	59.5	56.5	51.5	46.0	43.0
	Cardiff	40.0	39.5	41.5	45.0	49.5	54.5	57.5	58.0	55.0	49.5	44.5	41.0
	Newport (Mon)	40.0	39.0	41.5	45.0	50.0	55.0	58.0	58.0	54.5	49.0	44.0	40.5
	Welshpool	38.5	38.0	39.5	43.0	47.5	52.0	55.5	55.5	52.0	47.0	42.0	39.5
S.W. England	Bath	40.0	39.5	41.5	45.0	50.0	55.5	58.5	58.5	55.0	49.5	44.0	40.5
	Barnstaple	42.5	41.5	42.5	45.0	48.5	54.0	57.5	57.5	55.0	50.5	46.0	43.0
	Newquay	43.5	42.5	43.5	46.0	50.0	55.0	57.5	58.0	56.0	51.5	47.5	44.0
	Scilly	46.0	45.0	46.0	47.0	50.5	55.0	58.0	58.5	57.5	53.5	49.5	47.0
	Penzance	45.0	44.0	45.0	47.0	51.0	55.5	58.5	58.5	57.0	52.5	48.5	45.5
	Falmouth	44.0	43.0	44.5	46.5	50.5	55.5	58.5	58.5	56.5	52.5	48.0	44.5
	Plymouth	43.5	42.0	43.5	46.0	50.5	55.0	58.0	58.5	56.0	52.0	47.0	44.0
	Torquay	43.0	42.0	43.0	46.0	51.0	56.0	59.0	58.5	56.5	52.0	47.0	43.5
	Exmouth	41.5	41.0	42.0	45.0	49.5	54.5	57.5	58.0	55.5	50.5	45.5	42.0
S. England	Weymouth	42.0	41.5	42.5	45.5	50.5	55.5	59.0	59.5	57.0	52.0	46.5	43.0
	Bournemouth	40.5	40.0	42.0	45.0	50.0	55.0	58.5	59.0	55.5	50.0	45.0	41.0
	Southampton	40.0	39.5	41.5	45.0	50.5	55.5	58.5	59.0	55.5	50.0	44.5	41.0
	Newport I.O.W.	40.0	39.5	41.0	44.5	49.5	54.5	58.0	58.0	55.0	50.0	44.0	40.5
	Marlborough	38.0	37.5	39.0	42.0	47.0	52.0	55.0	55.0	52.0	47.0	41.5	38.5
	Reading	39.0	39.0	41.0	45.0	50.0	55.0	58.0	58.5	55.0	49.0	43.5	40.0
S.E. England	Bognor	40.5	40.0	41.5	45.0	50.0	55.5	59.0	59.5	56.5	51.0	45.5	41.5
	Eastbourne	40.5	40.0	41.5	45.5	50.5	55.5	59.5	60.0	57.0	51.5	46.0	41.5
	Dover	40.5	39.5	41.5	45.5	50.0	55.0	59.0	59.5	57.0	51.5	45.5	41.5
	Canterbury	39.0	39.0	41.0	45.0	49.5	55.0	58.5	58.5	55.5	49.5	44.0	40.0
	E. Malling	38.5	38.0	40.0	43.5	48.0	53.5	57.0	57.0	53.5	48.0	42.5	39.0
	Tubridge Wells	38.0	37.5	39.0	43.0	48.5	53.5	57.0	57.5	54.0	48.0	42.5	38.5
	Croydon	39.5	39.5	41.0	45.0	50.0	55.0	58.5	58.5	55.5	49.5	44.0	40.0
	Greenwich	39.5	39.0	41.0	44.5	49.5	55.0	59.0	59.0	55.5	49.0	43.5	40.0
	Enfield	38.5	38.5	41.0	45.0	50.0	55.5	59.0	59.0	55.5	49.0	43.0	39.5
	Kew	39.5	39.0	41.5	45.0	50.5	56.0	59.5	59.0	55.5	49.5	44.0	40.0
	Wisley	39.0	38.5	41.0	44.0	49.5	54.5	58.0	58.0	54.5	48.5	43.0	39.5
N. Ireland	Aldergrove	39.5	39.0	40.5	42.5	46.5	52.0	54.5	54.5	52.0	47.5	42.5	40.5